

TRILLIUM PERSISTENS (LILIACEAE), A NEW
PEDICELLATE-FLOWERED SPECIES FROM
NORTHEASTERN GEORGIA AND ADJACENT
NORTH CAROLINA

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The first evidence that this new species of pedicellate-flowered *Trillium* existed was the discovery of fruiting specimens by the senior author in Tallulah Gorge, Habersham Co., Ga., on 6 July 1950 (*Duncan* 11, 245). These specimens did not seem to belong to any described species and were finally filed with other miscellaneous "problem" specimens to be sent to persons specializing in the taxa involved. Some of the *Trillium* specimens were sent to Vanderbilt University for naming in 1966 and were identified as *T. catesbaei* Ell. In 1969 two mounted duplicate plants were identified as *T. catesbaei* by Robert G. Johnson (WVA) who had requested *Trillium* specimens for study. These determinations emphasize the similarity of many individuals of the two species when they are not in flower.

When they are flowering, they are obviously distinct. The first flowering specimens were found by Edna Garst on 28 March 1970 along Battle Creek in Oconee Co., South Carolina. On 12 April 1970 the junior authors decided that the *Trillium* was an unusual species, collected specimens with withered corollas from the Battle Creek colony, and brought them in for identification. Comparisons were made of these specimens with the several duplicate fruiting specimens that had been retained. This convinced us that they were conspecific and a new species. Additional specimens with withered corollas were collected by Neece and Garst from a second Habersham Co. locality on 24 April 1970. After observing many hundreds of freshly flowering specimens on 23 March 1971, and making needed measurements, the following description and accompanying text were prepared.

Trillium persistens Duncan, sp. nov.

Herba perennis, glabra. Scapi erecti, 12-25 cm longi.

Bracteae sessiles vel rarenter petiolo alato ad 2 mm longo, lanceolatae ad ovatae, 16-33 mm latae, ad apices acuminati vel raro acuti. Pedunculi arcuati ad erectiusculi, 12-33 mm longi. Sepala acuta, leviter expansa, 13-23 mm longa. Petala erectiscula versus basem et expansa versus apicem, 21-33 mm longa, 5-9 mm lata. Stamina recta, 9.5-13.8 mm longa, antheris introrsis. Ovarium leviter obovatum, acute sexangulum, stylo 2-6 mm longo. Semina circa 2 mm lata et 3.5-4.0 mm longa, minute undulata.

Plants are glabrous perennial herbs. When the flowers are fully opened, the *scapes* are erect, glabrous, 12-25 cm long, 2.5-4.5 times as long as bracts. *Bracts* sessile to very short stalked (to 2 mm long and winged), 3(5)-veined, lanceolate to ovate 16-33 mm wide, 31-95 mm long, 1.9-3.5 times as long as wide, the length 1.3-1.7 times the distance from the tip to the widest part, apices acuminate or rarely acute, the bases acute to obtuse, evenly green in color. *Flowers* above the bracts, on peduncles 12-34 mm long, one fourth to one-half as long as the bracts; peduncles arched to nearly erect (especially with age); the flowers at an angle to the peduncle or in a line with it, thus drooping to nearly erect. *Sepals* slightly outwardly curved, slightly divergent, 3(5)-veined, narrowly elliptic to narrowly ovate, 13-23 mm long, 4-6 mm wide, 3.2-4.9 times as long as wide, apices acute (rarely nearly obtuse) and finely cusped. *Petals* nearly erect towards base and spreading towards the tips, 3-veined, entire margined, undulate surfaced, nearly linear to narrowly elliptic, 21-33 mm long, 5-9 mm wide, 3.0-6.4 times as long as wide, apices acute (rarely nearly obtuse), tapered to a base about 1.7 mm wide, white, later becoming light reddish-purple except at the base, the base remaining white or nearly so. *Stamens* straight or nearly so, 9.5-13.8 mm long, erect to slightly divergent; *filaments* 0.7 mm wide, 4.8-6.0 mm long, 1.8 mm shorter to 0.2 mm longer than the anthers; *anthers* introrse, 4.6-7.8 mm long; *pollen* yellow; *connectives* barely prolonged (to 0.2 mm) and rounded at apex. Gynoecium height at tops of anthers to 4.3 mm beyond; *ovulary* slightly obovate, 2.8-5.5 mm long, sharply 6-angled; *styles* 2.0-6.0 mm long;

stigmas 3.0-7.5 mm long, 2 mm shorter to 2 mm longer than the ovulary, nearly straight to divergent at tips (especially with age). *Seeds* minutely undulate, about 2 mm wide and 3.5-4.0 mm long.

TYPE: *Duncan* 23548 with Garst and Neece. Rooted in well-decomposed litter and/or loose loam. With little other herbaceous growth under scattered *Rhododendron maximum* plants in open deciduous woods on a south-facing slope of Tallulah Gorge, Rabun Co., Georgia, 23 March 1971. HOLOTYPE: US; ISOTYPES: F, GA, GH, NY, VDB.

Trillium persistens individuals, although occurring in the cool Blue Ridge area, flower earlier than those of most species; and yet remain alive above ground until late summer, after other species have died back. Live individuals were found on 12 September (*Duncan* 23462 with Garst) when individuals of other *Trillium* species in the area were dead above ground. The specific epithet was chosen because of this characteristic.

Distribution: In deciduous or conifer-deciduous woods of ravines or gorges, under or near *Rhododendron maximum* L. or *R. minus* Michx., rooted in well-decomposed litter and/or loose loam. Rabun and Habersham Cos., Georgia; and Oconee Co., South Carolina. All known populations are within four miles of each other and in the Tallulah-Tugaloo River system.

Additional specimens: GEORGIA: Rabun Co., *Duncan* 23547 with Neece and Garst, 23 March 1971 (In flower). Under *R. maximum* in deciduous woods in small ravine near top of Tallulah Gorge and ESE of dam to Tallulah Falls Lake. Elev. about 1500 ft. Habersham Co., *Duncan* 11245, 6 July 1950 (In fruit). Rich, mesic, steep slopes in deciduous woods near bottom of Tallulah Gorge. Elev. about 980 ft. *Neece & Garst*, 24 April 1970 (With withered petals). Under or near *R. maximum* plants on terrace and slopes along Moccasin Creek from edge of Yonah Lake at about 750' elev. to about 900 ft. *Duncan* 23462 with Garst, 12 September 1970 (Fruits dehisced). Between scattered *R. maximum* plants in forest on north facing slope about 50 feet above Moccasin Creek and 0.1 mile from Yonah Lake. Elev. about 830 ft. *Duncan* 23549 with Garst and Neece, 23 March 1971 (In flower). Under scattered *R. maximum* plants on S side of Tallulah Gorge. Elev. about 980 ft. SOUTH CAROLINA: Oconee Co., *Garst*, 12 April 1970 (With withered petals). Under *R. maximum* on wooded

terrace in steep ravine; Battle Creek, about 1/3 mile from Lake Yonah. Elev. about 850 ft.

Trillium persistens seems related to *T. pusillum* Michx., *T. catesbaei*, and *T. nivale* Riddell. They form a group having a prominent common style, and each is similar to one or more of the others in a number of characters. When flowers are fully developed, *T. pusillum* may be separated by its obtuse bracts, sepals which are obtuse and horizontally spreading or nearly so, and the ovate and obscurely angled ovary; *T. catesbaei* by its ovate to elliptic and petioled (3-12 mm) bracts, sepals that are 20-40 mm long and reflexed or curled, petals that are recurved and 30-55 mm long and 18-30 mm wide, stamens that are curved and 16-26 mm long, and wider filaments; and *T. nivale* by its oval to ovate and obtuse or rarely acute and distinctly petioled (5-10 mm) bracts, and its round 3-lobed ovary. Before flowers are fully opened some plants are difficult to place. However, when differences in geography and the "arrival of spring" are considered, *T. pusillum* and *T. catesbaei* are later flowering. *Trillium persistens* also resembles some individuals of *T. grandiflorum* (Michx.) Salisb. in early flowering stage. The latter species also has straight anthers and a style (though short — to one mm) but may be separated by its shorter style, wider bracts and petals, and ovate ovary. Of the four other species probably only *T. catesbaei* and *T. grandiflorum* are sympatric with *T. persistens*. *T. pusillum* may occur nearby in northwestern South Carolina (Gates, 1917¹).

Trillium persistens does not occur in large clusters, but as scattered individuals or clusters of less than ten. A two hour search by the junior authors along Moccasin Creek (Habersham Co., Ga.) led to the discovery of only 120 plants along a 0.2 mi stretch beginning at Yonah Lake. Plants are no denser up Battle Creek (Oconee Co., S.C.), but were found as scattered individuals to an elevation of 1200 feet. In Tallulah Gorge (Habersham and Rabun Cos., Ga.) individuals were also mostly scattered but they

¹GATES, R. R. A systematic study of the North American genus *Trillium*, its variability, etc. Ann. Mo. Bot. Gard. 4: 43-92. 1917.

were distributed over a much larger area and to about 1500 feet elevation.

Along the two creeks *T. persistens* occurs under or very near *Rhododendron maximum*. It is often associated with *Medeola virginica* L. Two other Trilliums, *T. catesbaei* and *T. cuneatum* Raf., were seen along both creeks and *T. discolor* abundantly along Battle Creek. The forest along the creeks is characterized by *Tsuga canadensis* (L.) Carr., *Fagus grandifolia* Ehrh., *Liriodendron tulipifera* L., *Tilia heterophylla* Vent., *Betula lenta* L., *Magnolia fraseri* Walt., *Acer rubrum* L., and *Quercus*.

In 1970 and 1971 *T. persistens* in its native habitats began flowering around 20 March. Some flowers were withering by the first of April and practically all, if not all, by the middle of April. Flowering time may be more meaningful when compared to those of other species. *Erythronium* begins flowering earlier and is concluding flowering as *T. persistens* is beginning; *Viola hastata* Michx., *Epigaea repens* L., and *Hepatica acutiloba* DC. flower at about the same time; and *Trillium discolor* Wray begins about the time many flowers of *T. persistens* are withering. At Athens, Georgia, a transplanted plant of *T. persistens* flowered 15 March 1971 while native plants of *T. catesbaei* and transplants of *T. grandiflorum* began flowering over one month later.

Pollen from one plant of *T. persistens* was stained in aniline-blue lactophenol for 24 hours. All 314 grains examined were well stained. Thirty grains varied in size from 30-37 μ and averaged 32.8 μ .

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